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**LANDFILL CAP MAINTENANCE PLAN  
SWMU 11  
(KILN DUST LANDFILLS A & B)**

**HEARTLAND CEMENT COMPANY  
dba BUZZI UNICEM USA  
INDEPENDENCE, KANSAS**

**NOVEMBER 2015**

**Prepared for:**

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
REGION 7  
AIR AND WASTE MANAGEMENT DIVISION  
LENEXA, KANSAS**

**Project No. 152602.0176**



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|-------------------|--|

## **1.0     INTRODUCTION**

Heartland Cement Company, dba Buzzi Unicem USA (Heartland), has prepared this Landfill Cap Maintenance Plan for Solid Waste Management Unit (SWMU 11) – Kiln Dust Landfills A & B (aka Old and New CKD Landfills) in accordance with the United States Environmental Protection Agency (USEPA) Section III.K.2.a, Engineering Control, as required in Heartlands USEPA RCRA/HSWA permit dated July 18, 2013.

The purpose of the SWMU 11 Landfill Cap Management Plan is to describe the procedures to maintain the integrity and effectiveness of the final cover, including making repairs as necessary.

## **2.0     SITE DESCRIPTION AND BACKGROUND**

### **2.1     Location**

The Heartland property comprises approximately eleven hundred (1,100) acres located in a rural agricultural area of Montgomery County in southeastern Kansas. The Heartland property adjoins the southeast corner of the City of Independence. The Verdigris River borders the property to the northeast and east, and some scattered residences are located approximately one-half (0.5) mile southwest of the plant property. Rock Creek, a tributary of the Verdigris River, flows easterly through the Heartland property. The location of the Heartland facility affected by the RCRA permit lies within this property boundary and is provided on Figure 1. The Verdigris River borders the east portion of the facility, and County Road 4100 borders the west portion of the facility. Rock Creek is located to the south of the facility, and farm fields lie to the north. The facility area contains SWMU 11 and SWMU 10 and is approximately 107.7 acres.

SWMU 11 consists of two cement kiln dust (CKD) landfills identified as the Old CKD Landfill and the New CKD Landfill. The Old CKD Landfill is located approximately 500 feet north of the former Heartland plant, adjacent to a rail spur that terminated at the southern end of the landfill limit. The landfill is an irregularly shaped area of generally



homogeneous CKD deposits. The Old CKD Landfill comprises approximately 16.8 acres. The location of the Old CKD Landfill is presented in Figure 2.

The New CKD Landfill is located approximately 700 feet west of the plant, adjacent to the facility entrance road. The landfill is an irregularly shaped area consisting of generally homogeneous CKD deposits. The New CKD Landfill comprises approximately 6.4 acres. The location of the New CKD Landfill is presented in Figure 2.

## **2.2 Facility Description/Background**

The original cement plant began operations in 1905. The location for the plant was chosen due to the availability of limestone for use as a raw material. Cement operations at the site included quarrying, raw material preparation, cement production, and cement storage/shipping facilities. Quarry and cement production activities were terminated at the Heartland plant in September 2008.

At the time that Heartland utilized hazardous waste-derived fuels for burning during their manufacturing process, they were required to obtain a Part B RCRA permit in order to store these fuels. The permit included a provision to conduct a RCRA Facility Investigation (RFI) and ensure that corrective actions are taken in response to releases from Heartland SWMUs or when releases are suspected. The waste fuel operations at the facility were discontinued in 2000, and clean closure was completed in 2001.

Numerous RFI and follow up activities have taken place at SWMU 11 since 1991 through the present, including the installation and sampling of groundwater monitoring wells at both the Old CKD Landfill area and the New CKD Landfill area. Based on information obtained from the RFIs and groundwater assessment activities, several metals may be leaching from the Old CKD Landfill into the shallow alluvial groundwater within close proximity to the Old CKD Landfill.



**FIGURE 2**  
**SWMU 11 LOCATION MAP**  
**HEARTLAND CEMENT COMPANY**  
**dba BUZZI UNICEM, USA**  
**INDEPENDENCE, KANSAS**



These constituents of concern appear to be contained within Heartland's property boundary and pose little health risk to potential downgradient receptors. The closest downgradient domestic well is over one (1) mile away, and is separated from Heartland by the Verdigris River. Bedrock groundwater does not appear to be impacted with excessive levels of constituents of concern because it is confined within a tight, massive shale, and it is not hydraulically connected to the alluvial aquifer. Rock Creek also does not appear to be impacted.

On July 18, 2013, the USEPA issued Heartland a new RCRA/HSWA permit that identified corrective action provisions pertaining to known SWMUs and Areas of Concern (AOCs) at the Heartland facility. The corrective measure selected for this unit includes engineering control specified in III.K.2.a. Capping of SWMU 11 was completed in December 2012, and closure certification was received from Kansas Department of Health (KDHE) in July 2013.

Capping of SWMU 11, Landfill A, consisted of placing 18 inches of compacted cover material with a hydraulic conductivity of no greater than  $1 \times 10^{-5}$  cm/sec topped with 18 inches to 24 inches of soil for vegetative cover, then vegetated. Landfill B had about 24 inches of shale placed over the landfill area and compacted over a period of six years from 2002 to 2008, but no documentation for QA/QC was recorded. Landfill B closure was completed according to the closure plan approved for the landfill 515 and the approved construction QAP for the landfills. The shale layer was contour graded and final capping consisted of placing 18 inches of compacted cover material with a hydraulic conductivity of no greater than  $1 \times 10^{-5}$  cm/sec topped with 12 inches of soil for vegetative cover, then vegetated.

In November 2015, the USEPA requested that Heartland develop a Landfill Cap Management Plan for SWMU 11 as a means to maintain the integrity and effectiveness of the final cover.

### **3.0 LANDFILL CAP INSPECTION MAINTENANCE PROCEDURES**

This section outlines the inspection and maintenance program to be undertaken at SWMU 11 to ensure that the integrity of the cover is not compromised and continues to function as designed. Inspection and maintenance tasks include subsidence/consolidation, slope stability, soil cover, vegetation, stormwater management structures, and erosion in surrounding features so that maintenance actions can be taken in a timely manner.

#### **3.1 Inspection Procedures**

Routine inspection of the landfill cap and associated appurtenances will be conducted on a semi-annual basis to minimize the effects of subsidence/consolidation, slope stability, soil cover, vegetation, stormwater management structures, and erosional features. Inspections will be performed by qualified personnel and reviewed by a competent professional. Inspections will encompass the following subjects, as described in the following sections: subsidence/consolidation, slope stability, soil cover, vegetation, stormwater management structures, run-on controls, and related matters. Inspections will be performed using a prescribed form containing a checklist of items that documents the evaluation of site conditions. The inspection form is presented in Appendix A. The inspection form will be signed and dated by the inspector and the reviewer. The findings and observations of the site inspection will be entered on the form. Minor repairs or maintenance may be performed in conjunction with the inspection and will be noted on the inspection form.

#### **3.2 Subsidence/Consolidation**

Subsidence and consolidation at the SWMU 11 Kiln Dust Landfills largely depend on how well the CKD and cover material were compacted when placed. Subsidence or continued consolidation may result in differential settlement which generally occurs when one area of CKD settles more readily than another. Differential settlement across the landfills may create cracks on the surface, which would allow precipitation to infiltrate more easily. Differential settlement can also change the topography of the landfill and create areas on the surface where ponding of water can occur. Construction of the final cover system

included placement of engineered fills and repair of unsuitable areas. In addition, CKD is a fine powder and does not decompose. Therefore, cover subsidence or consolidation is of little concern. Nevertheless, differential settlement may occur.

### **3.2.1 Inspection Procedures**

Subsidence/consolidation at the SWMU 11 Kiln Dust Landfills will be monitored by visually inspecting the surface of the landfill cover for cracks, depressions, heaving, and sinkholes. Visual inspections will involve traversing the landfill perspective on regions of the landfill (i.e. every square foot of the landfill will not be inspected). Areas of observed differential settlement, including ponding, will be staked, photographed, measured, and located on a site map prior to any maintenance action.

### **3.2.2 Maintenance Activities**

The maintenance actions that will normally occur to correct the effect of adverse differential settlement are to place additional soil and regrade the affected area and re-vegetate the area. This action will eliminate the potential for ponding and/or correct the slope of the surface.

## **3.3 Slope Stability**

Some areas of the SWMU 11 Kiln Dust Landfills may be susceptible to instability due to lateral movement. Slope failures can be caused by the weight of the CKD and cover material, steeply graded slopes, and seepage forces resulting from water infiltration. Seismic forces can also cause slope failures. Steep slopes produce less stable conditions and are more susceptible to failure. Slope failures can also occur within the CKD mass, resulting in downslope sliding of cover components. The cover system has been designed and constructed to guard against slope failure. Nevertheless, slope stability will be monitored to verify that slope failures are not in progress.

### **3.3.1 Inspection Procedures**

Slope stability at the SWMU 11 Kiln Dust Landfills will be monitored by visually inspecting the cover system side slopes for evidence of block failure, and evidence of circular failure. Visual inspection will involve traversing the slope to gain a perspective of the entire slope. Any areas where a surface seep is identified will be photographed, marked, located on a site map, and monitored for signs of slope instability. Areas identified during the inspections as potential slope stability concerns will be photographed, located on a site map, and staked for further monitoring. If adverse surface water flow into cracks is likely, actions such as filling the cracks or controlling surface water flows will be taken to prevent surface water from entering the cracked area. If further monitoring indicates a continued stability concern after taking these maintenance actions, Heartland, will consult a qualified geotechnical engineer.

### **3.3.2 Maintenance Activities**

Based on the site inspection and consultation with a qualified geotechnical engineer, maintenance actions will be taken to address any potential slope failure at the SWMU 11 Kiln Dust Landfills that would likely compromise the remedy. The actions may include, but not be limited to, regrading affected areas, filling areas, maintaining positive drainage of surface water, and regrading slopes. Areas where maintenance activities have taken place will be closely monitored and documented for further slope stability concerns.

## **3.4 Soil Cover**

The soil cover system of the SWMU 11 Kiln Dust Landfills was designed and installed to minimize soil erosion from both water and wind erosion. During the post-closure period, it is important to ensure that both temporary and permanent erosion controls are functioning properly. Regardless, the soil cover thickness may change overtime due to wind and water erosion. Subsidence due to CKD settlement and lateral movement of CKD or slopes may also contribute to changes in differential soil cover thickness. Monitoring of the soil cover

is conducted to verify the cover is performing in accordance with the design and the SWMU 11 Kiln Dust Landfills system as a whole continues to meet performance objectives.

#### **3.4.1 Inspection Procedures**

Monitoring of the soil cover at the SWMU 11 Kiln Dust Landfills includes the following:

- Visually inspecting the soil cover for erosion or deposition areas;
- Visually inspecting the soil cover for signs of burrowing animals; and,
- Visually inspecting diversion berms for erosion rills or excessive deposition

Visual inspection involved traversing the slope to gain perspective of the entire area. Signs of rill and gully erosion will be photographed, marked with stakes, measured. Located on the Heartland site map, and reported on the inspection form. Additionally, areas of observed soil deposition will also be photographed, marked, measured, located on the Heartland site map, and reported on the inspection form.

#### **3.4.2 Maintenance Activities**

If monitoring indicates significant loss of soil over time, maintenance actions will be taken. If a gully is measured at equal to or more than 6 inches deep, maintenance actions will be implemented. The actions may include, but not be limited to, soil replacement, regrading the affected areas to match adjacent grades, and removing and relocating any deposited eroded soils (if necessary). The regraded areas will be vegetated to prevent further erosion. Erosional control measures will be implemented to prevent further erosion of cover soils (e.g. erosion control mat and/or revegetation), if necessary.

### **3.5 Vegetation**

Vegetation is important at the SWMU 11 Kiln Dust Landfills to aid with short-term and long-term erosion control. Surface vegetation will be established on the soil layer to enhance resistance to soil erosion, prevent intrusion of noxious weeds and burrowing animals, and to provide an aesthetic appearance to the cover.

#### **3.5.1 Inspection Procedures**

Vegetation of the SWMU 11 Kiln Dust Landfills will be monitored by visually inspecting the cover system for evidence of distressed vegetation or areas where vegetation is not present. Inspections will involve traversing the landfill to gain a perspective of the entire landfill. Any areas where vegetation concerns are identified, will be photographed, marked, and located on a site map, and reported on the inspection form.

#### **3.5.2 Maintenance Activities**

If visual inspections indicate vegetation concerns on the cover, maintenance actions will be taken. Actions may include, but not be limited to, the following:

- Reseeding of the soil cover;
- Spot herbicide applications;
- Maintenance/repair of erosional controls; and,
- Removal of deep-rooting trees or shrubs growing in the cap and repair of area.

### **3.6 Stormwater Management Structures**

Stormwater management will be required at the SWMU 11 Kiln Dust Landfills to ensure that existing stormwater control structures (man-made drainage features) are functioning adequately to enhance the following objectives:

- Prevent run-on and run-off from eroding or damaging the cover; and,
- Limit transport and sediment from the disturbed areas to off-site drainage ways.

### **3.6.1 Inspection Procedures**

Stormwater management structures will be monitored visually by waling the structures and examining all components. Problem areas will be noted on the inspection form, graphically depicted, and photographed. At a minimum, these structures will be inspected for signs of excessive erosion, settlement, bank failures, breaching of the diversion berms, subsidence, burrowing animals, and blockage. Signs of potential problems include, but are not limited to, gullyng, sediment building up, and depressions.

### **3.6.2 Maintenance Activities**

If the inspections indicate that the existing stormwater management structures are not adequately controlling surface water run-on and run-off, maintenance action will be taken.

As necessary, routine maintenance of the surface water controls will include removing any blockages, filling eroded areas, or repairing other disturbances. Sediment will be moved from the sotrmwater management structures to restore the disng characteristics of the structure. Areas tht exhibit excessive erosion may require placement of erosion control material or strengthening of the existing erosion control measure.

## **3.7 Run-On Erosion Control**

Erosion control inspections will take place in natural drainage areas around the SWMU 11 Kiln Dust Landfills to prevent excess sediment load and to ensure erosion is not problematic. Natural drainages and slopes around the SWMU 11 Kiln Dust Landfills will be inspected for excess erosion.

### **3.7.1 Inspection Procedures**

The natural drainages will be visually monitored to identify sign of soil erosion that could adversely impact the SWMU 11 Kiln Dust Landfills or conditions that may cause an overload on the existing stormwater management structures.

### **3.7.2 Maintenance Activities**

If inspections indicate soil loss, excessive disturbance in the areas, the presence of erosion gullies, or other evidence of erosion, maintenance action will be taken. The slope areas are more susceptible to water erosion in the event of high intensity rainfall and are of particular concern. Actions may include placing additional soil, regrading, and seeding of the affected areas. Other erosion control measures that may be implemented include, but are not limited to, placing erosion mat, riprap, straw bale barrier(s), and silt fencing.

## **4.0 RECORDKEEPING PLAN**

All inspection forms and any reports prepared as part of the Landfill Cap Maintenance Plan will be kept on-site at the Heartland terminal office, as well as of the Buzzi Unicem USA corporate offices in Bethlehem, Pennsylvania.

As set forth in Section II.E.9.b of the RCRA/HSWA permit, Heartland shall maintain records from all Landfill Cap Maintenance Plan activities until completion of the post-closure care period.

## **5.0 REPORTING**

All inspection forms and any reports prepared as part of the Landfill Cap Maintenance Plan will be provided in accordance with the reporting requirements speculated in RCRA/HSWA permit Section II.G.

Unless otherwise specified, two (2) copies of forms, reports, notifications, or other submissions required by the Heartland RCRA/HSWA permit shall be submitted to USEPA via certified mail, delivery service, or hand delivered to:

U.S. Environmental Protection Agency, Region 7  
Air and Waste Management Division  
Waste Remediation and Permits Branch  
ATTN: Ken Herstowski  
11201 Renner Blvd.  
Lenexa, Kansas 66129

In addition, one (1) copy of these forms, reports, notifications, or other submissions shall be submitted to:

Kansas Department of Health and Environmental  
Curtis State Office Building  
Bureau of Waste Management  
Hazardous Waste Permit Section  
ATTN: Mostafa Kamal  
1000 SW Jackson, Suite 320  
Topeka, Kansas 66612-1366

## 6.0 CERTIFICATION


Pursuant to Section II.F of the RCRA/HSWA permit, SYA and Heartland are providing the following certification.

I certify under penalty of law that this document and all attachments were prepared under my direct supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Date: 11/30/15

Date: 12-2-15

Signature: 

Signature: 

Name: Robert J. Schreiber, Jr., P.E., Q.E.P.

Name: John White

Registered Kansas Professional Engineer

Registration Number 11219

Title: Senior VP of Logistics

Buzzi Unicem USA Inc.

Schreiber, Yonley & Associates

Heartland Cement Company

16252 Westwoods Business Park Drive

dba Buzzi Unicem USA

Ellisville, Missouri 63021

**APPENDIX A**

**SWMU 11 CKD Landfills  
INSPECTION FORM**

# SWMU 11 KILN DUST LANDFILLS – MONITORING AND MAINTENANCE PROGRAM

## INSPECTION FORM

INSPECTOR: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_ REVIEWED BY: \_\_\_\_\_

TEMPERATURE: \_\_\_\_\_ WEATHER CONDITIONS: \_\_\_\_\_ REVIEW DATE: \_\_\_\_\_

### SUBSIDENCE/CONSOLIDATION

| REGION                  | EVIDENCE OF<br>CRACKS?                                   | EVIDENCE OF<br>DEPRESSIONS?                              | EVIDENCE OF<br>SINK HOLES:                               | EVIDENCE OF<br>PONDING?                                  | OTHER<br>(DESCRIBE BELOW) |
|-------------------------|--|--|--|--|---------------------------|
| <b>New CKD Landfill</b> |  |  |  |  |                           |
| Top of Cover – West     | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Top of Cover – East     | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Top of Cover – North    | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Top of Cover – South    | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - West       | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - East       | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - North      | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - South      | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| <b>Old CKD Landfill</b> |  |  |  |  |                           |
| Top of Cover – West     | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Top of Cover – East     | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Top of Cover – North    | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Top of Cover – South    | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - West       | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - East       | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - North      | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - South      | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |

MAINTENANCE REQUIRED/COMMENTS/PHOTO LOG

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|                        |
|------------------------|
| <b>SLOPE STABILITY</b> |
|------------------------|

| REGION                  | EVIDENCE OF<br>CRACKS?                                   | EVIDENCE OF BLOCK OR<br>CIRCULAR FAILURE?                | EVIDENCE OF<br>SEEPS?                                    | OTHER<br>(DESCRIBE BELOW) |
|-------------------------|--|--|--|---------------------------|
| <b>New CKD Landfill</b> |  |  |  |                           |
| Side Slope - West       | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - East       | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - North      | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope – South      | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| <b>Old CKD Landfill</b> |  |  |  |                           |
| Side Slope - West       | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - East       | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - North      | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope – South      | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |

MAINTENANCE REQUIRED/COMMENTS/PHOTO LOG

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|                   |
|-------------------|
| <b>SOIL COVER</b> |
|-------------------|

| REGION                  | EVIDENCE OF<br>SOIL DEPOSITION<br>OR EROSION?            | EVIDENCE OF<br>EROSION<br>RILLS/GULLIES?                 | EVIDENCE OF<br>BURROWING<br>ANIMALS?                     | OTHER<br>(DESCRIBE BELOW) |
|-------------------------|--|--|--|---------------------------|
| <b>New CKD Landfill</b> |  |  |  |                           |
| Top of Cover – West     | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Top of Cover – East     | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Top of Cover – North    | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Top of Cover – South    | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - West       | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - East       | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - North      | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - South      | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| <b>Old CKD Landfill</b> |  |  |  |                           |
| Top of Cover – West     | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Top of Cover – East     | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Top of Cover – North    | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Top of Cover – South    | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - West       | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - East       | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - North      | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |
| Side Slope - South      | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |                           |

MAINTENANCE REQUIRED/COMMENTS/PHOTO LOG

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## STORMWATER MANAGEMENT STRUCTURES

### CHANNELS/LINING

| STRUCTURE           | EVIDENCE OF<br>EXCESSIVE EROSION,<br>GULLYING, SCOUR,<br>OR UNDERMINING? | EVIDENCE OF<br>SETTLEMENT/<br>SUBSIDENCE OR<br>DEPRESSIONS? | EVIDENCE OF<br>BREACHING OR<br>BANK FAILURE?             | EVIDENCE OF<br>BURROWING<br>ANIMALS?                     | EVIDENCE OF<br>SEDIMENT BUILD-<br>UP OR OTHER<br>BLOCKAGE? | EVIDENCE OF<br>LINING<br>DETERIORATION,<br>HOLES, RIPS, OR<br>SEPARATION? | EVIDENCE OF<br>LINING<br>DISPLACEMENT?                   |
|---------------------|--|---|--|--|--|---|--|
| New CKD<br>Landfill | <input type="checkbox"/> Yes <input type="checkbox"/> No                 | <input type="checkbox"/> Yes <input type="checkbox"/> No    | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No   | <input type="checkbox"/> Yes <input type="checkbox"/> No                  | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Old CKD<br>Landfill | <input type="checkbox"/> Yes <input type="checkbox"/> No                 | <input type="checkbox"/> Yes <input type="checkbox"/> No    | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No   | <input type="checkbox"/> Yes <input type="checkbox"/> No                  | <input type="checkbox"/> Yes <input type="checkbox"/> No |

OTHER DEFICIENCIES?

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MAINTENANCE REQUIRED/COMMENTS/PHOTO LOG

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"RUN-ON" EROSION CONTROL

| AREA             | ADVERSELY AFFECTING SWMU 11 KILN DUST LANDFILLS:         |          |
|------------------|--|----------|
| New CKD Landfill | <input type="checkbox"/> Yes <input type="checkbox"/> No | COMMENT: |
| Old CKD Landfill | <input type="checkbox"/> Yes <input type="checkbox"/> No | COMMENT: |

MAINTENANCE REQUIRED/COMMENTS/PHOTO LOG

ACTION ITEMS

| DEFICIENCY | DATE NOTED | ACTION | DATE<br>COMPETED | COMMENTS |
|------------|------------|--------|------------------|----------|
|            |            |        |                  |          |
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|            |            |        |                  |          |
|            |            |        |                  |          |
|            |            |        |                  |          |

INSPECTOR SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

REVIEWER SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_